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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
MILLS, DONALD L	

ART UNIT	PAPER NUMBER
2416	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/076,367	LEE ET AL.	
	Examiner	Art Unit	
	DONALD L. MILLS	2416	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *28 April 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-78* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-78* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. Applicant's request for reconsideration of the finality of the rejection of the last Office action is persuasive and, therefore, the finality of that action is withdrawn.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claims 47-60 and 78 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Regarding claims 47-60 and 78, the claims specify *a computer readable medium* (For example see claim 47, lines 1 and 2); however, neither the original claims nor the specification define the term "computer readable medium." Therefore, the claims contain subject matter which was not described in the specification in such a way to reasonably convey to one skilled in the relevant art that the inventors, at the time the application was filed, had possession of the claimed invention.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 1, 2, 24, 25, 47, 61, and 75-78 are rejected under 35 U.S.C. 103(a) as being unpatentable over Uga et al. (US 6,718,326 B2), hereinafter referred to as Uga, in view of Connery et al. (US 6,570,884 B1), hereinafter referred to as Connery.

Regarding claims 1, 24, 47, 61, and 75-78, Uga discloses a packet classification search device and method, which comprises:

Receiving an incoming data packet (Referring to Figure 1, router **100** comprises a packet classification search device for classifying received packets. See column 8, lines 56-63 and column 9, lines 8-13;)

Parsing the incoming data packet to obtain a portion of the incoming data packet (Referring to Figure 2, the header extraction device **610** extracts the header from a packet. See column 9, lines 66-67;)

Comparing said portion with rules stored in a rule table, where each rule of said rules specifies a set of actions; Selecting a match between said portion and a particular rule of said rules; and executing a particular set of actions specified by said particular rule (Referring to Figures 3, 4, and 20, based upon the packet classification and the corresponding match, a rule is used to determine a set of actions to be taken, such as, forwarding the packet while setting priority to high. See column 10, lines 34-61;)

Each rule field of the rules includes a selection flag used in the comparing the portion with each rule (Referring to Figures, 3, 4, and 20, each rule field comprises a number of information flags used in the comparison of the header with each rule. See column 10, lines 52-61.)

Uga does not disclose *each rule field of the rules includes a mask.*

Connery teaches a receive filter for communication interfaces, which comprises mask logic circuits to generate a hash in response to bytes selected by the mask, and comparator which compares the output of the has logic with an expected hash. If a match is detected then the processor is signaled that the packet being received is, or may be, suitable for processing on the network interface card. The mask logic uses the mask modifier in response to the packet format, so that variations of a particular format can be handled with a single set of pattern match logic circuits (Referring to Figures 1-5, see abstract and column 4, lines 10-36 and column 5, line 38 to column 6, line 29.)

It would have been obvious to one of ordinary skill in the art at the time of the invention to implement the mask logic circuits of Connery in the rule searching sub-system of the packet classifier of Uga. One of ordinary skill in the art at the time of the invention would have been motivated to do so in order to improve the speed and efficiency in which a packet classifier can search through rules for packet classification whose bit width is extremely great, as taught by Uga (See column 4, lines 32-53.)

Regarding claims 2 and 25, the primary reference further teaches *wherein the step of comparing said portion with rules stored in a rule table comprises comparing specific fields of the incoming data packet with corresponding rule fields in all of the rules stored in the rule table*

(Referring to Figure 4, it is possible for certain packets to require a search through all of the rules. See column 10, line 34 to column 11, line 57.)

Regarding claims 6, 29, 48, and 62 as explained in the rejection statement claims 1, 24, 47, and 61, Uga and Connery teach all of the claim limitations of claims 1, 24, 47, and 61 (parent claims).

Uga does not explicitly disclose *applying the encoded compact mask of the rule fields to corresponding fields of the incoming data packet to obtain a packet field value; comparing the packet field value with a rule field value contained in the one of the rules; and examining the selection flag of the one of the rule fields to determine whether the one of the rules is a potential match.*

Uga teaches based upon the packet classification and the corresponding match, a rule is used to determine a set of actions to be taken, such as, forwarding the packet while setting priority to high (See column 10, lines 34-61), and each rule field comprises a number of information flags used in the comparison of the header with each rule (See column 10, lines 52-61.) However, Connery teaches a receive filter for communication interfaces, which comprises mask logic circuits to generate a hash in response to bytes selected by the mask, and comparator which compares the output of the has logic with an expected hash. If a match is detected then the processor is signaled that the packet being received is, or may be, suitable for processing on the network interface card. The mask logic uses the mask modifier in response to the packet format, so that variations of a particular format can be handled with a single set of pattern match logic circuits (Referring to Figures 1-5, see abstract and column 4, lines 10-36 and column 5, line 38 to column 6, line 29.)

It would have been obvious to one of ordinary skill in the art at the time of the invention to implement the mask logic circuits of Connery in the rule searching sub-system of the packet classifier of Uga. One of ordinary skill in the art at the time of the invention would have been motivated to do so in order to improve the speed and efficiency in which a packet classifier can search through rules for packet classification whose bit width is extremely great, as taught by Uga (See column 4, lines 32-53.)

Regarding claims 7, 8, 30, 31, 49, 50, 63, and 64 as explained in the rejection statement claims 1, 24, 47, and 61, Uga and Connery teach all of the claim limitations of claims 1, 24, 47, and 61 (parent claims).

Uga does not explicitly disclose *rule fields with a fixed location and a compact mask, rule fields with a fixed location and a full mask that is as wide as the packet field value, and rule fields with a programmable field location which allows the rule field value to be mapped to any contiguous section of the portion of the incoming data packet.*

Connery teaches a mask having 128 bits (compact mask), byte wide summing networks (full mask) syndrome and logical function (programmable) generators, in which the 128 bits corresponding to 128 bytes of an incoming packet (See column 5, lines 1 to column 6, line 11.)

It would have been obvious to one of ordinary skill in the art at the time of the invention to implement the mask logic circuits of Connery in the rule searching sub-system of the packet classifier of Uga. One of ordinary skill in the art at the time of the invention would have been motivated to do so in order to improve the speed and efficiency in which a packet classifier can search through rules for packet classification whose bit width is extremely great, as taught by Uga (See column 4, lines 32-53.)

Regarding claims 9, 32, 51, and 65 as explained in the rejection statement claims 1, 24, 47, and 61, Uga and Connery teach all of the claim limitations of claims 1, 24, 47, and 61 (parent claims).

Uga does not explicitly disclose *the full mask is applied to the portion to obtain at least one of an IP destination address and an IP source address as the packet field value.*

Uga teaches utilizing the source and destination IP address (See Figure 20.)

Connery teaches a mask having 128 bits (compact mask), byte wide summing networks (full mask) syndrome and logical function (programmable) generators, in which the 128 bits corresponding to 128 bytes of an incoming packet (See column 5, lines 1 to column 6, line 11.)

It would have been obvious to one of ordinary skill in the art at the time of the invention to implement the mask logic circuits of Connery in the rule searching sub-system of the packet classifier of Uga. One of ordinary skill in the art at the time of the invention would have been motivated to do so in order to improve the speed and efficiency in which a packet classifier can search through rules for packet classification whose bit width is extremely great, as taught by Uga (See column 4, lines 32-53.)

Regarding claims 19 and 42, the primary reference further teaches *wherein the step of executing a particular set of actions specified by said particular rule comprises modifying a header of the incoming data packet, forwarding the incoming data packet to a destination address, or updating a management information register* (Referring to Figure 20, the packet is parsed, header extracted, and forwarded according to priority as established by the rule. See Abstract.)

Regarding claims 22 and 45, the primary reference further teaches *wherein the step of comparing said portion with rules stored in a rule table comprises comparing said portion with rules stored in a rule table implemented in a static random access memory, with three types of rule fields and action fields all stored in each row of the static random access memory* (Referring to Figure 20, rules are applied (in memory) in a rules table.)

Regarding claims 23 and 46, the primary reference further teaches *wherein the step of comparing said portion with rules stored in a rule table comprises comparing said portion with rules stored in a rule table implemented in a content addressed memory, where each entry of the content addressed memory includes a selection flag and a validity bit* (Referring to Figure 23, rules are applied (in memory) in a rules table with selection flag and search flag.)

6. Claims 3-5, 26-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Uga (US 6,718,326 B2) in view of Connery (US 6,570,884 B1) in further view of Kadambi et al. (US 6,850,521 B1), hereinafter referred to as Kadambi.

Regarding claims 3 and 26 as explained in the rejection statement of claims 1 and 24, Uga and Connery teach all of the claim limitations of claims 1 and 24 (parent claims).

Uga does not disclose *wherein specific fields of the packet include a source port identification number and Layer 2 to Layer 7 headers.*

Kadambi teaches a network switch for switching packets from a source to a destination, which utilizes filtering logic to perform lookups of the rules table, which comprises packet filters from layer **2** to layer **7** of the OSI seven layer model (See column 39, lines 58-59.)

It would have been obvious to one of ordinary skill in the art at the time of the invention to implement the multi-layer filtering logic of Kadambi in the system of Uga. One of ordinary skill in the art at the time of the invention would have been motivated to do so in order to identify packets in more detail by packet classification according to QoA, VPN, firewalls, and the like, as taught by Uga (See column 1, line 52 to column 2, line 4.)

Regarding claims 4, 5, 12-18, 27, 28, 35-41, 54-60, and 68-74 as explained in the rejection statement of claims 1, 24, 47, and 61, Uga and Connery teach all of the claim limitations of claims 1, 24, 47, and 61 (parent claims).

Uga does not disclose *wherein the step of selecting a match between said portion and a particular rule of said rules comprises selecting a highest priority rule of said rules to be the particular rule when more than one rule of said rules match said portion.*

Kadambi teaches a network switch for switching packets from a source to a destination, which utilizes filtering logic to perform lookups of the rules table, which comprises when there is a partial match, actions associated with the filter mask are taken unless there is a full match with a higher filter value, then the actions associated with the rule entry are taken (highest priority) (See column 37, lines 57-64.)

It would have been obvious to one of ordinary skill in the art at the time of the invention to implement the multi-layer filtering logic of Kadambi in the system of Uga. One of ordinary skill in the art at the time of the invention would have been motivated to do so in order to identify packets in more detail by packet classification according to QoA, VPN, firewalls, and the like, as taught by Uga (See column 1, line 52 to column 2, line 4.)

Regarding claims 10, 33, 52, and 66 as explained in the rejection statement claims 1, 24, 47, and 61, Uga and Connery teach all of the claim limitations of claims 1, 24, 47, and 61 (parent claims).

Uga does not explicitly disclose *examining a global programmable flag to determine whether a start address of the programmable field location is a beginning of a layer 2 header or a layer 3 header of the incoming packet.*

Kadambi teaches multi-field classifiers filter layer 2 and layer 3 headers specified by an offset based upon the NMA bit (See column 31, lines 29-34 and column 39, liens 49-56.)

It would have been obvious to one of ordinary skill in the art at the time of the invention to implement the multi-layer filtering logic of Kadambi in the system of Uga. One of ordinary skill in the art at the time of the invention would have been motivated to do so in order to identify packets in more detail by packet classification according to QoA, VPN, firewalls, and the like, as taught by Uga (See column 1, line 52 to column 2, line 4.)

Regarding claims 11, 34, 53, and 67 as explained in the rejection statement claims 1, 24, 47, and 61, Uga and Connery teach all of the claim limitations of claims 1, 24, 47, and 61 (parent claims).

Uga does not explicitly disclose *inverting the result of the comparing the packet field value step when the selection flag is set to a particular value.*

Kadambi teaches when the NMA bit is set to one, the filter is an exclusive filter (See column 33, lines 40-43.)

It would have been obvious to one of ordinary skill in the art at the time of the invention to implement the multi-layer filtering logic of Kadambi in the system of Uga. One of ordinary

skill in the art at the time of the invention would have been motivated to do so in order to identify packets in more detail by packet classification according to QoA, VPN, firewalls, and the like, as taught by Uga (See column 1, line 52 to column 2, line 4.)

Regarding claims 20 and 43 as explained in the rejection statement claims 1 and 24, Uga and Connery teach all of the claim limitations of claims 1 and 24 (parent claims).

Uga does not explicitly disclose *wherein the step of updating a management information register comprises providing a bitmap used to increment individual counters indicating a forwarding, dropping, or processing of certain types of packets*

Kadambi teaches the filtering logic can discard the packet, send the packet to the CPU **52**, modify the packet header or IP header, based upon the filter mask which is essentially a bit map, then update the counters (See column 34, lines 35-37; column 35, lines 60-64; and column 38, lines 1-5.)

It would have been obvious to one of ordinary skill in the art at the time of the invention to implement the multi-layer filtering logic of Kadambi in the system of Uga. One of ordinary skill in the art at the time of the invention would have been motivated to do so in order to identify packets in more detail by packet classification according to QoA, VPN, firewalls, and the like, as taught by Uga (See column 1, line 52 to column 2, line 4.)

Regarding claims 21 and 44 as explained in the rejection statement claims 1 and 24, Uga and Connery teach all of the claim limitations of claims 1 and 24 (parent claims).

Uga does not explicitly disclose *wherein said particular set of actions comprises setting a flow identification for the incoming data packet such that the packet is classified according to a class of service.*

Kadambi teaches the packet is sent on priority COS Queue (See column 34, lines 39-40.)

It would have been obvious to one of ordinary skill in the art at the time of the invention to implement the multi-layer filtering logic of Kadambi in the system of Uga. One of ordinary skill in the art at the time of the invention would have been motivated to do so in order to identify packets in more detail by packet classification according to QoA, VPN, firewalls, and the like, as taught by Uga (See column 1, line 52 to column 2, line 4.)

Response to Arguments

7. Applicant's arguments, see response, filed 28 April 2008, with respect to claims 1-78 have been fully considered and are persuasive. The rejection of claims 1-78 has been withdrawn. Based upon an updated search, A new rejection of claims 1-78 is presented in this Office Action.

Conclusion

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to DONALD L. MILLS whose telephone number is (571)272-3094. The examiner can normally be reached on 9:00 AM to 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chi Pham can be reached on 571-272-3179. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Donald L Mills/
Primary Examiner, Art Unit 2416